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**A** regular broadcasting service, licensed by the Postmaster-General (PMG) to provide programmes of speech and music in the United Kingdom, was launched by the British Broadcasting Company (BBC) in November 1922. The company was a consortium of six manufacturers of wireless apparatus, namely Western Electric; Marconi; General Electric; British Thomson-Houston; Radio Communication Company; Metropolitan Vickers, and a number of smaller manufacturers.

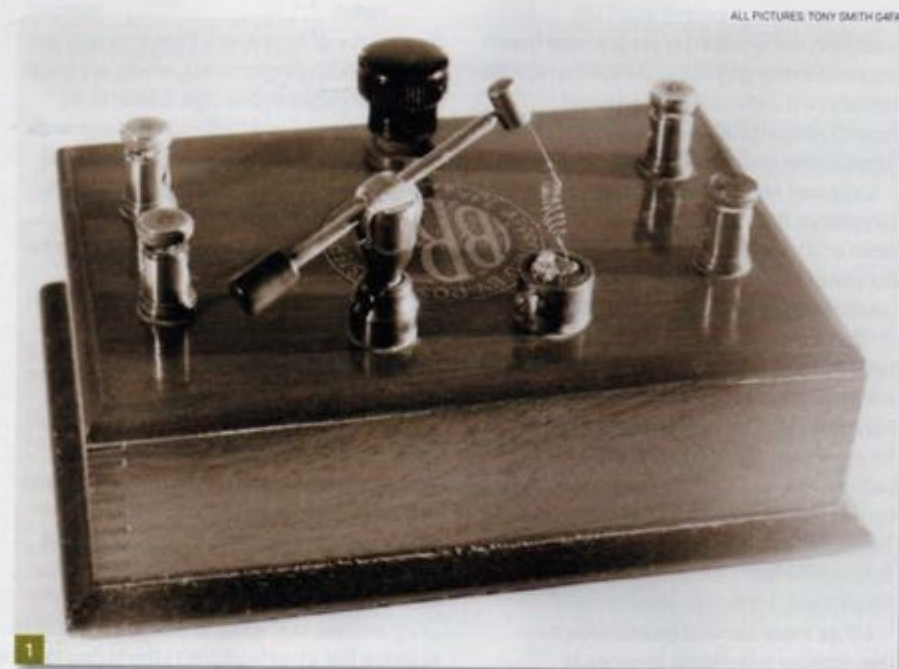
From the beginning, the BBC sought to provide varied and new experiences for its listeners who, in 1923, heard the first outside broadcast, the first weather forecast, the first Greenwich time signal, the first Big Ben time signal and the first continental programme relayed by landline. The following year, 1924, saw the first religious broadcast, the first broadcast to schools, the first broadcast by the King, a live running commentary from the Lord Mayor's Show in London, and a relay from America.

By 1925, the service was beginning to settle down and take shape with even more experimental and innovative presentations to entertain and intrigue the ever-growing numbers of wireless enthusiasts across the country. At the same time, technical improvements in transmission provided improved reception over all areas.

### Homemade Receivers

Listeners mainly used homemade receivers, principally crystal sets (Fig. 1). Components for them were widely available (Fig. 2), and the simplest sets could be made by anyone, including school children. The broadcasts were on medium wave, and there was no sign yet of professional shortwave broadcasting. Nevertheless, broadcasts or other transmissions could be heard at times on medium wave from other countries, including Belgium, France, Germany and Holland.

To be able to listen, a Broadcasting licence was required, permitting the licensee to own and operate a receiver to receive 'music, speech, and news items,' transmitted by British broadcasting stations. This was available to anyone over 21 years (or to parents on behalf of



## Bottled Wireless, Radio-Film, & the Nightingale's Song

Tony Smith tunes in to the year 1925, looking at the transmissions of the British Broadcasting Company, the equipment used to receive them, and the experiments undertaken in that age of remarkable originality.

minors), for ten shillings, but many listeners who thought the price was too high used their sets illegally, without a licence.

Representations were made to the Postmaster General (PMG) to allow weekly low-wage earners to pay for their licences by instalments. The PMG's reply was, in effect, that if everyone paid up he would consider reducing the price to five shillings! At this time, there were approximately 1,356,000 licences in force.

A report in *Wireless World* estimated that a further 1,250,000 listeners had not yet taken out a licence.

### Popular Radios

For most, a crystal set was the only option, either bought commercially or home-constructed, and there were a large number

of kits on the market, which were much cheaper than ready-built sets. The cheapest 'ready-made' set was sold pre-tuned to operate on a fixed wavelength, usually 1,600 metres, that of the BBC's Daventry transmitter, and for use with a 100 feet aerial. No tuning was required, the cat's whisker was simply manipulated across the surface of the crystal until the best result was found.

Coil tuner sets had a coil with sliding contacts for tuning, with a cat's whisker and a crystal requiring an adjustment in the usual way. Tuning with a variometer set was easier. The variometer control was simply turned until something was heard, then adjusted to the best position for the loudest signals received. When semi-permanent and automatic crystal detectors became

Fig. 1: A simple crystal set. Fig. 2: Crystals were readily available for home constructors. Fig. 3: Home-made regenerative three-valve radio with horn speaker. Fig. 4: Early valves did not have a long life. Fig. 5: An H.T. battery and L.T. accumulator used for the first valve sets. Fig. 6: A NNC 'Meat-safe' studio microphone. A Marconi-Sykes Magnetophone moving coil microphone was suspended in a rubber sling inside a Faraday Cage.

available, a set's tuning adjustment could be fixed for best results. All that was needed was to put the headphones on!

A crystal set gave satisfactory results, provided it was located within a reasonable range of a broadcasting station. Its sole disadvantage was that the signals were not very loud so most people, eventually thought about getting a valve set, which would work with a horn loudspeaker (Fig. 3) or provide much louder signals on headphones.

### Valve Sets

The super-heterodyne had not proved as popular as anticipated, with a price beyond the means of most listeners. A small number had been built by enthusiasts, but the vast majority had constructed Reflex, Unidyne (HT-less), 'straight,' and other types of valve (Fig. 4) sets.

These early sets were mainly of the TRF (tuned radio frequency) type, often with reaction to control sensitivity. They required an H.T. (high tension, 90V) battery, together with an L.T. (low-tension, 2V) accumulator (Fig. 5). The latter needed charging regularly and topping up with distilled water. They were usually taken to a garage, a bicycle shop or an electrical shop. In some places, entrepreneurs provided a door-to-door replacement service, delivering a charged accumulator and taking away the old one for recharging.

A mains H.T. battery eliminator had been introduced by E.K. Cole Ltd a year previously, and the possibility of dispensing with an H.T. battery now existed, although many homes still did not have a mains electricity supply. The licence required all regenerative valve sets sold to be of an approved type, incapable of causing interference to nearby stations when operated by an unskilled person. Interference was usually caused by advancing the reaction control too far, causing the detector valve to oscillate. This functioned as a transmitter and interfered with the reception of other sets in the vicinity. Home-made sets were more likely to cause this problem than commercially made sets, and listeners were constantly

reminded in the magazines of the day that this was both an illegal and anti-social activity.

### Technical Improvements

The BBC's major event of the year, in 1925, was the opening of a new 25kW long wave station, 5XX, at Daventry, estimated to serve over 23 million listeners and providing a much better signal for many crystal set users. With a T-formation aerial, 500 feet high, it was hypothetically capable of providing a national broadcasting service to 94 per cent of the population of the UK.

The 2LO London transmitter (Table 1) was transferred from its site at Marconi House in the Strand to the top of Selfridges store in Oxford Street in April, with twice the power of the previous station. It provided satisfactory crystal set reception for listeners within a range of 25 miles, compared to 17 miles from the previous transmitter, and it increased the strength of signals in the London area for around 90 per cent of listeners.

A central receiving station was constructed at Keston in Kent with two fixed aerial masts 60 feet high, 120 feet apart, and directional aerials to pick up foreign stations. As an experiment, the opening speech of the French Prime Minister at the League of Nations Conference in Geneva was relayed by landline from Geneva to Paris from where it was sent by wireless link to Keston.

Unfortunately, the changeover to wireless from such a long landline link resulted in clipping and distortion, and the initial



broadcast was not a success. A speech by Mr Austen Chamberlain, Britain's Foreign Secretary, the next day was broadcast with greater success, despite some interference by Morse signals from two telegraph stations near the wavelength of the Eiffel Tower.

[see also Scott Caldwell's article on the Eiffel Tower in the June 2021 issue of RadioUser - Ed.]

BBC engineers were examining a new machine, an early form of electromagnetic wire recorder, with a view to recording programmes for rebroadcasting. Nicknamed 'Bottled Wireless,' experiments had shown that, while speech recording was satisfactory, music did not record so well. Various difficulties had to be overcome, but the engineers believed it was only a question of time before the system was perfected.

### National Coverage

Nine regional stations, each of about 1kW, broadcast from main cities throughout the UK, each producing programmes of local as well as general interest. Simultaneous broadcasting of particular programmes took place via Post Office landlines when they were considered of sufficient interest. Regular news bulletins were simultaneously broadcast through all stations from 2LO in London.

As some areas with large populations had difficulty in receiving satisfactory signals on crystal sets, 11 relay stations, each of about 200 Watts and linked by landline, received and rebroadcast programmes from their

main city stations. The regional stations were: 2LO London on 365m; 5IT Birmingham on 479m; 2ZY Manchester on 378m; 5NO Newcastle on 404m; 5WA Cardiff on 353m; 5SC Glasgow on 422m; 2BD Aberdeen on 495m; 6BM Bournemouth on 386m; and 2BE Belfast on 440m.

They were all linked by landline to the national station 5XX Daventry on 1600m long wave when simultaneous broadcasting was required.

### Review of the Year

A review of the previous year in the 1926 *Radio Year Book* commented on the extraordinary extent to which wireless had succeeded in capturing and holding the public interest in such a brief time. Wireless was steadily becoming as much of the daily life of the people as a newspaper. These were pioneering and exciting times for both the BBC and its listeners as new techniques and new types of programme were developed. During the year, 567,000 new broadcast receiving licences had been issued. It was estimated that 10 million people now listened to BBC programmes, and that, in two years, the number could reach 20 million.

The engineers were constantly seeking new broadcast experiences, which they referred to as 'stunts' to intrigue the listeners. In London, an experimental 'radio film' linked a short silent film sequence at a cinema in Shepherd's Bush with synchronised background music relayed to the cinema by the BBC from the Prince of Wales' theatre. The experimental synchronisation of film and music was considered successful, and further broadcasts were planned.

### Outside Broadcasts

An outside broadcast from the London Zoo used a 'Wireless Pram,' fitted with a specially-designed transmitter. This was pushed round the zoo to broadcast the sounds of the parrot house, baboons, chimpanzees and other animals, followed by a talk on the peculiarities of animals and birds.

Another experimental transmission was made when 'characteristic noises' were transmitted from King's Cross station, followed by a discussion between a BBC announcer and an official of the railway on the footplate of the *Flying Scotsman*, as it steamed out of the station one evening.

For this broadcast, a battery-powered transmitter was installed in a brake van on the train. A three-wire aerial was mounted

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18 inches above the roof of the van. An earth connection was made to the two bogies of the van and the tender and engine, and an improved carbon type microphone was suspended in the engine's cab by rubber bands to avoid vibration from the engine. The receiving aerial was a single wire, one of a group of line-side telegraph wires between Potters Bar and Hitchin. Cut at each end, it was tapped at Hatfield station and connected to a wireless receiver, the signals from which were transferred by Post Office landlines to the Savoy Hill studio and simultaneously broadcast from all BBC stations.

### High Flyers and Top Bidders

A flying lesson was broadcast directly from an aircraft in mid-air. Alan Cobham, a famous pioneer of long-distance aviation, instructed his pupil (Miss Heather Thatcher, a well-known actress and dancer) "in every problem of aeroplane management." His instructions were transmitted by wireless to a receiver on the ground from which they were relayed to 2LO by landline. To emphasise the reality of the broadcast, "the noises associated with taking off and landing were included in the broadcast."

Adding to the "novel diversity of subjects available to the listeners" was a broadcast from Christie's Auction Rooms in London when pictures belonging to the Countess of Carnarvon, including a famous Gainsborough, were auctioned. The microphone was placed on the auctioneer's rostrum and the progress of the bidding was relayed to 2LO. In a forerunner of today's natural history broadcasts, the song of the nightingale was broadcast live from

its native habitat. BBC engineers went deep into Oxted Wood, letting out a quarter mile of cable, to achieve a three-minute broadcast of the birdsong accompanied by a well-known cellist, Miss Beatrice Harrison, playing her cello in the garden of her house near the wood. The first attempt was a failure, but all went well with a second attempt at a later date.

### Studio Audiences

During the year, consideration was given to the concept of a 'public broadcasting studio,' visualised as "the establishment of psychological contact not only between artist and audience but between listener and listener." The idea was to "arouse the listener at home to a consciousness of the response of an audience to a broadcast performance from a public hall."

Recognising that performing alone in a studio "militated against an artist's best performance," the public were admitted to a number of broadcasts from King George's Hall, London, as they had been previously to symphony concerts direct from Covent Garden, and Central Hall, Westminster.

A limited number of visitors were also allowed to occupy seats in the studio for programmes like *Radio Radiance Revue*, featuring songs, music and sketches by well-known West End artists; and other revues and musical extravaganza.

### Some Disappointment

The RAF Display at Hendon was one of the disappointments of the year. A squadron of aircraft was to be flown through various manoeuvres under the control of an officer flying with the aircraft. His R/T commands

to each pilot and exchanges with the ground were to be broadcast to demonstrate the difficulties of intercommunication by voice with the noise of the engines dominating everything.

Rehearsals had proved satisfactory but, on the day, after the first command, which listeners heard perfectly, the broadcast was blotted out by a powerful heterodyne, believed to be deliberate. The RAF had previously announced the wavelength to be used and had, perhaps unwisely, issued an appeal to the public to refrain from interference on it. *An Hour in a King's Ship* was relayed to 2LO from HMS President, HQ of the London Division of the Royal Naval Volunteer Reserve. Part of the broadcast involved a 'man-overboard incident,' involving the use of three microphones and a hydrophone to pick up the sounds of a lifeboat being launched; the crew being alerted, and noises under the water. One of the microphones was damaged as the lifeboat was being lowered, but the engineer in charge was able to maintain transmission; the broadcast was completed successfully.

### Underground Broadcasts

Constantly looking for new ways to educate or entertain the listeners, the BBC presented lessons in the *French Tango*. A dance teacher gave a talk on the dance and, in later broadcasts, he described the steps in detail, as he danced with, and instructed, a partner in the studio to the sound of appropriate music.

Following a successful broadcast from the Whitwood Collieries in Yorkshire the previous year, when the colliery band had performed a musical selection and a talk had been given from the pit bottom, 1,500 feet below ground, the Sheffield regional station undertook a similar broadcast in June.

On this occasion, the sounds of coal cutting, boring, explosion shot, fall of coal, filling of tubs, the noise of the train, and signals controlling the working of the cage, were heard directly from 750 feet below the surface.

### York Minster and Canterbury Cathedral

Severe acoustical problems were overcome in broadcasts from York Minster and Canterbury Cathedral. An 11-second echo at York was a major concern but, thanks to the use of strategically-placed microphones and special correcting apparatus, there was no trace of the echo in the broadcasts. In

the Minster itself, the congregation, seated more than 30 feet from the pulpit, could not hear the preacher clearly because of the noises of a large number of people present. At 200 miles away, listeners could hear every word distinctly. At Canterbury, owing to even more difficult acoustics, the echo had again to be overcome, while speech, received by a microphone placed more than seven feet from the choir, was unintelligible. Special arrangements were made again to ensure successful transmission.

### Third Birthday

The BBC marked the completion of its third year of operation with special birthday broadcasts throughout the week of 8-14th November. The Prince of Wales broadcast a *Poppy Day* message in support of Earl Haigh's British Legion Fund; The Archbishop of Canterbury preached from Canterbury Cathedral on Armistice Day; the Prime Minister spoke from the banquet at Guildhall on Lord Mayor's Day; and several other famous people were heard during the week, including Sir Oliver Lodge and Sir Robert Baden-Powell, founder of the Boy Scout movement. It was a week of great choices for the listeners. Many famous orchestras, bands and performers were heard. There was also comedy, drama, a Radio Military Tattoo, and a concert broadcast direct from an aeroplane flying above Croydon Aerodrome.

### Light Entertainment

The *Radio Radiances* dancers broadcast their first musical revue from 2LO. A report commented, "The pit-pat of the dancing could plainly be heard by listeners-in." Norah Blaney and Gwen Farrar, a famous musical comedy act of the time, gave a farewell performance to listeners across the UK prior to their departure for America. Max Darewski, musical prodigy, pianist and composer, also appeared, playing a number of his own compositions. Music lovers were thrilled when the famous Italian coloratura soprano, Madame Luisa Tetrazzini, broadcast from 2LO; and Sir Alexander MacKenzie, Director of the Royal Academy of Music, conducted a concert of his own works. A host of other well-known entertainers of the time were regularly heard in the BBC broadcasts, nationally, or in local programmes generated by the various regional stations.

### Agreement with Theatres

There was concern in the entertainment industry that BBC broadcasts could



adversely affect attendances at live performances. Accordingly, an agreement was entered into with the industry that the BBC could broadcast up to 26 excerpts from stage performances per annum, if possible at fortnightly intervals, but not more than once in any one week.

Repertory grand opera and similar productions were not included in this agreement; if they were broadcast twice in any one week there should be no stage broadcast in that week. No first-night performances were to be broadcast, and the BBC was to arrange, as far as possible, that Fridays and Saturdays should be the only nights of the week when stage excerpts would be broadcast and should not normally exceed 30 minutes.

No cabaret performances were to be aired during theatre hours. The BBC was not to present plays touring the provinces during the first 12 months of a tour and was to endeavour to exclude broadcasting excerpts of plays actually being performed on stage from being relayed to towns where the plays were running.

In the search for originality, the BBC explored the possibility of introducing natural noises into a new type of radio play. Instead of leaving everything to the imagination of the listeners, it was intended to transport them in mind to the scene described by speech or song. Country plays would have a background of country noises; town plays of town noises, and plays relating to life in the armed services would have their natural settings. It was also hoped to produce several plays connected with open-air life, "with the appropriate atmosphere."

### Broadcasting Talks

Throughout the year, many famous personalities responded to the challenge of the new medium and willingly took part in BBC broadcasts. The Prime Minister, Mr Stanley Baldwin, appealed for funds for a club for working girls; Mr Ramsay MacDonald, the country's first Labour Prime Minister, gave a talk on "Open Diplomacy"; the Earl of Meath, founder of *Empire Day*, made a speech on the day; a group of Tibetan priests who were with the Mount Everest Exhibition visited 2LO and broadcast several Tibetan chants and instrumental music; Mr A.E.R. Gilligan, Captain of the English Cricket Team broadcast an account of that year's cricket tour; French tennis star Suzanne Lenglen broadcast a tennis talk.

Twice-monthly talks by the Radio Society of Great Britain (RSGB) were also broadcast by 2LO, each lasting 15 minutes. Previously broadcast weekly, the time of each broadcast had been extended in the hope that this would "considerably increase" the interest of the listeners in this feature. The microphone 'interview' had proved so successful, on the few occasions when it had been attempted, that the Birmingham station 5IT intended to try a similar experiment, when Mrs E.W. Barnes, the wife of the Bishop of Birmingham was to be interviewed in front of the microphone (Fig. 6) by a Birmingham journalist.

### Broadcasts for Children

Schools broadcasts had begun the previous year from 2LO and continued throughout 1925, relayed nationally through 5XX, with an increasing number of schools taking advantage of them. All the regional stations broadcast their versions of *Children's Hour*, each hosted and presented by 'Uncles or 'Aunties,' with the object of providing a balanced programme, avoiding any impression of 'education.' They included news bulletins; stories of all kinds; talks on music, books and travel; competitions and plays. From this early start, *BBC Children's Hour* broadcasts continued for many years until 1964.

### Listener's Comments

The Company believed that there was public support for its intellectual ideals and standards. It declined to limit its programmes to ephemeral entertainment. It took the view that broadcasting should be the means not only of amusing but of instructing and guiding its listeners.

However, the listeners did not always



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agree. Following a broadcast of *The Tempest*, some commented on the difficulty of identifying the numerous characters in the play, expressing a preference for presentations, not exceeding 20 minutes, and with fewer characters. One simply wrote, "I'm fed up with Shakespeare!"

Another wrote about "unknown speakers talking on subjects of limited interest, at times when light music would be more acceptable." Other comments included: "Broadcasting, on the whole, is as dry as dust, with very little appealing to the average man or woman," and "If the BBC had to arrange the programmes for any theatre, music hall or picture house they would empty it in a fortnight!"

Others liked the presentations very much. One listener wrote, "I and my family are completely satisfied with the BBC programmes." Another wrote, after hearing a broadcast of *Westward Ho*, by Charles Kingsley, "The background noises were most realistic. The sound of the seawater was wonderful. How do you do it?" The BBC replied, "that is a trade secret and may not be divulged!"

Following a complaint received, the PMG reported that no evidence had been received regarding injuries to pigeons through collision with wireless aerials, but he had asked the National Homing Union to furnish information so that the matter could be given further consideration!

### Tuesday, 19th May 1925:

- 13.00 Holborn Restaurant, London, Luncheon music.
- 15.15 Transmission to schools, Miss Ethel Home (*Characters of Tunes*).
- 16.00 Books to read, by Ann Spice. Organ and Orchestral Music relayed from Shepherd's Bush Pavilion. *What do we mean by Play?* by Muriel Wrinch.
- 18.00 Children's Corner (Pinkety and Old Mother Ribbony Rose), from The Enid Blyton *Book of Fairies*.  
Astronomy Talk by Captain Ainslie.  
Music by Auntie Sophie.
- 18.30 Children's Letters
- 18.40 Music.
- 19.00 Weather Forecast and First General News Bulletin [\*S.B. to all stations].  
James Agate (*Dramatic Criticism*) [\*S.B. to all stations].
- 19.25 Music [\*S.B. to all stations].
- 19.40 Elephant hunting in Burma. Travel Picture by Lieut.-Col. M. C. Nangle [\*S.B. to other stations].
- 20.00 \*\*Concert arranged by the \*\*Fleetway House Press [\*S.B. to all stations].
- 22.00 Weather Forecast and Second General News Bulletin [\*S.B. to all stations].  
Prof. J. Arthur Thomson: *The Underworld of Animals* [\*S.B. from Aberdeen].  
Local News. Contributors.
- 22.30 *The Savoy Orpheans* and *Savoy Havana Band* relayed from the Savoy Hotel, London [\*S.B. to all stations].
- 23.30 Closedown

\* S.B. = Simultaneous Broadcast

\*\*The BBC's licence allowed it to carry sponsored programmes. Eight such programmes were aired in 1925 and were well received by the listeners, many of whom thought they were of a better standard than the regular BBC programmes. On Sundays, only serious programmes were broadcast, e.g., hymns, prayers, talks, organ recitals, classical music, news bulletins, and weather reports.

Table 1: A Day's broadcasting from 2LO, London.

### One More Year to Run

Not everyone can be pleased at the same time; but considering the adventurous and pioneering state of the early technology and the difficulties that were overcome, the broadcast engineers, producers, and performers created an interesting mix of features, including the forerunners of many broadcast techniques and programmes taken for granted today. The British Broadcasting Company had one more year to run. It was dissolved at the end of 1926. Its assets and its ideals were transferred to the British Broadcasting Corporation on 1st January 1927. The rest is history.